

## **REMARKS**

### **I. Status of the Claims**

Upon entry of this Amendment, claims 1, 11, 13, 14, 16, 18, and 20-27 are pending in this application. Claims 1, 11, 13, 14, 16, 18, and 20 are amended, and new claims 21-27 are added. Claims 1 and 11 are amended to recite "[a] method of weather modification," with support throughout the specification, for example at page 11. Claims 1 and 11 are further amended for clarification and to replace the term "super-cool" with "supercooled" known generally in the art. See, e.g., specification at page 17. Claims 13, 14, and 16 are amended for clarification and to conform with amended claim 1 from which they depend. Claim 18 is amended to recite "[a] method for preventing hail formation" with support, for example, in the specification at page 18. Claim 20 is amended to recite "[a] method for activating rainfall from stratiform clouds" with support found, for example, at pages 18 and 19 of the specification. Support for new dependent claim 21 can also be found at pages 18 and 19 of the specification. Support for new claims 21-27 may be found in the specification, for example, pages 12-16, and in original claims 1, 3, 5, 7, 8, and 10.

Accordingly, no new matter is added by the foregoing amendments.

### **II. Summary of Interview**

Applicant acknowledges and appreciates the courtesies extended by Examiner James Hogan and Supervisory Patent Examiner Len Tran to Applicant's representative, Mark Sweet, during a personal interview on August 5, 2009. During this interview, proposed amendments were discussed to more clearly define the claimed invention.

This Amendment contains all of the proposed amendments discussed during the interview.

Additionally, Applicant's representative informed the Examiners that an Information Disclosure Statement (IDS) would be filed with this Amendment. An IDS was concurrently filed with this Amendment.

### **III. Rejection Under 35 U.S.C. § 103(a)**

#### **A. Claims 1, 11, and 18**

The Office maintains the rejection of claims 1, 11, and 18 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,362,271 to Montmory ("Montmory") in view of U.S. Patent No. 5,357,865 to Mather ("Mather"), U.S. Patent No. 3,659,785 to Nelson et al. ("Nelson"), U.S. Patent No. 3,613,992 to Knollenberg ("Knollenberg") and U.S. Patent No. 6,056,203 to Fukata ("Fukata-1"). Office Action at page 3. The Office asserts that "it would have been obvious to one skilled in the art at the time the invention was made to have simultaneously combined the known cloud seeding techniques, in any sequence of Montmory, Nelson et al, Fukata, Mather (865) and Knollenberg ('992) to insure the eruption of rain or to prevent hail." *Id.* at 5. Applicant respectfully continues to disagree and traverse the rejection.

To support a rejection under § 103(a), the Office must clearly articulate the reasons why the claimed invention would have been obvious. M.P.E.P § 2142. "The Federal Circuit has stated that "rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *Id.*, citing *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006); *see also KSR*

*International Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741, 82 USPQ2d, 1385, 1396 (2007).

In making its determination on obviousness, the Office must consider the claimed invention and the prior art **as a whole**, including portions of the prior art that would lead away from the claimed invention. See M.P.E.P. § 2141.02(I), (VI). This the Office has not done.

The Office acknowledges that “obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. Office Action at page 2. But the Office repeatedly disregards contradictory teachings in the cited references that leave the skilled artisan without the necessary guidance to attempt, or even to contemplate, the presently-claimed invention. As set forth in detail below, Applicant respectfully submits that the Office’s conclusory statements contained in the Office Action fail to establish a case of *prima facie* obviousness.

Applicant’s claim 1 recites the step “Attacking” to initiate rainfall “wherein at least one first endothermic-hygroscopic chemical comprising sodium chloride and at least one second endothermic-hygroscopic chemical comprising urea are **simultaneously dispersed** at mid-cloud level and at the cloud base, respectively . . .” (emphasis added). According to the Office, “Montmory discloses part of the step of ‘attacking’ (that is, the use of a device, as described in column 4, lines 32-59, and Col. 4, lines 51-60)

where micro droplets of the combined hygroscopic chemicals are sprayed into and at the at the base of clouds from an aircraft." *Id.* at 3. Applicant disagrees.

Montmory **teaches away** from the present claims, stating that "using a solid particle dispersion is not a good choice for various physical reasons." Montmory at col. 3, ll. 7-9. Instead, Montmory teaches liquid microdroplets of dimethyl sulfoxide (DMSO). *Id.* at Abstract. And Montmory fails to teach **simultaneous dispersion** of chemicals as recited in the present claims. Rather, Montmory teaches the following:

To carry out the procedure according to the invention the microdroplets [of DMSO] may be dispersed **either** from the ground (in the case of fog) **or** from aerial devices such as rockets, airplanes or helicopters adapted to contain the dispersion equipment (in the case of stimulating rain or preventing hail). The aerial seeding procedure is carried out using known techniques, **either** in the clouds **or** at their base, **or** even in the frontal zone of a storm cell.

*Id.* at col. 4, ll. 50-59 (emphasis added). Thus, Montmory clearly discloses either ground-based dispersion or air-based dispersion, not a combination thereof. Nothing in Montmory teaches, or even suggests, the **simultaneous dispersion** of chemicals as presently claimed.

The Office cites Mather for teaching use of sodium chloride. Office Action at page 4. Mather teaches a pyrotechnic composition requiring an oxidizing agent, potassium chlorate or potassium perchlorate, as a burning flare. *See* Mather at Abstract. Sodium chloride is disclosed as an optional, additional ingredient. *Id.* at col. 1, ll. 58-60. There is no teaching or suggestion to use sodium chloride in any matter other than in combination with the oxidizing agent required for the burning flare, and thus does not disclose using sodium chloride in a method for causing rainfall.

Mather further **teaches away** from the invention recited in claim 11. Applicant's claim 11 recites the "Attacking" step wherein "at least one first endothermic-hygroscopic chemical comprising sodium chloride and at least one second endothermic-hygroscopic chemical comprising urea are **simultaneously dispersed** from aircraft upwind at mid-cloud level and at the cloud base level, respectively, while glaciogenic chemicals are seeded from aircraft into the top of the cloud, and supercooled chemicals comprising dry ice are **simultaneously dispersed** from aircraft below the cloud base . . . ." In contrast, Mather teaches that "[h]ygroscopic seeding in accordance with the method of the present invention has substantial advantages over glaciogenic seeding, e.g., seeding with silver iodide . . . ." *Id.* at col. 5, ll. 51-54. Thus, Mather clearly distinguishes the pyrotechnic composition from glaciogenic seeding, and provides no suggestion to combine those two techniques. Moreover, the skilled artisan would be guided by Mather to avoid glaciogenic seeding altogether. See *id.* at col. 5, line 55 to col. 6, line 7.

The Office also cites Nelson for teaching sodium chloride. Office Action at page 4. Nelson lists sodium chloride is listed as an exemplary hygroscopic material, where "[t]he use of hygroscopic seed materials for fog dissipation over harbors, highways and airports prohibits the use of those hygroscopic materials which are corrosive." Nelson at col. 2, ll. 29-35. Nelson teaches microencapsulated particles to provide improved seeding results to overcome such problems. *Id.* at Abstract. The present claims do not recite microencapsulated particles. As such, Nelson **teaches away** from use of sodium chloride in the methods presently claimed.

The Office then cites Knollenberg as teaching urea. Office Action at page 4. Here, the Office disregards Knollenberg's discussion contrasting other techniques and

chemicals, including silver iodide and dry ice. For example, Knollenberg teaches that silver iodide "tends to decompose after a short exposure to the atmosphere," and "[s]olid carbon dioxide suffers from the disadvantage that it readily sublimates under atmospheric conditions. . . . it is relatively insensitive since the number of ice particles produced per particle of solid carbon dioxide is relatively small." Knollenberg at col. 1, ll. 47-62. Far from combining techniques, Knollenberg teaches materials, e.g., urea, that "embrace all the advantages of the prior art approaches and possess[ ] none of the aforementioned disadvantages." *Id.* at col. 1, ll. 59-62. One of ordinary skill in the art would therefore have had no reason to combine chemicals, as the Office asserts, when Knollenberg teaches one chemical as being sufficient. And the Office's proposed combination ignores the express teaching in Knollenberg to use a single chemical.

Additionally, the Office acknowledges that Montmory, Mather, and Knollenberg do not teach the step of "Enhancing" recited in the present claims. Office Action at page 4. Applicant's claim 1 recites the step "Enhancing" wherein "supercooled chemicals comprising dry ice are further dispersed from aircraft below the cloud base." According to the Office, Fukata-1 "teaches 'to enhance' the volume of rainfall by the use of silver iodide flairs [sic] . . . ." Office Action at pages 4-5.

But Fukata-1 actually **teaches away** from use of silver iodide, stating that "[t]he ice crystal generating ability of nucleus substances like AgI drops drastically as temperature increases from about -10°C., and it cannot satisfy the necessary number of ice crystals for cloud seeding in the temperature range." Fukata-1 at col. 3, ll. 59-62. Fukata-1 proposes liquid carbon dioxide (LC) as "the central figure" of the invention. *Id.* at col. 5, ll. 5-10. Fukata-1 also **teaches away** from dry ice, recited in the present

claims, disclosing that dry ice results in insufficient crystal growth. *See id.* at col. 4, ll. 29-62. Fukata-1 provides no further information to establish obviousness over the present claims.

As shown above, the Office fails to consider the cited references in their entirety, including the numerous disclosures that expressly teaches away from the presently-claimed invention. The Office further fails to consider the present claims, as a whole. *See* M.P.E.P. § 2141.02(I), (VI). To succeed in achieving Applicant's claims, as the Office suggests, the skilled artisan would have to pick and choose among varied disclosures in the cited references, selectively disregarding numerous contradictory teachings. That is not the standard for obviousness.

Furthermore, none of Montmory, Mather, Nelson, Knollenbery, and Fukata, alone or in combination, teach or suggest the sequence of steps recited in the present claims requiring **simultaneous dispersion** of chemicals. *See*, for example, the "Attacking" step recited in independent claims 1, 11, and 18.

For these reasons, Applicant submits that the Office fails to establish a *prima facie* case of obviousness over claims 1, 11, and 18, and respectfully requests that the rejection be withdrawn.

#### **B. Claims 13, 14, 16, and 20**

The Office maintains the rejection of claims 13, 14, 16, and 20 under 35 U.S.C. § 103(a) as allegedly unpatentable over Mather in view of Montmory, Nelson, Knollenberg, Fukata-1, and U.S. Patent No. 5,628,455 to Fukata ("Fukata-2"). Office Action at page 5. Applicant respectfully continues to disagree and traverse the rejection.

As discussed above, none of Montmory, Mather, Nelson, and Knollenberg, alone or in combination, teach or suggest the methods claimed in Applicant's claim 1, upon which claims 13, 14, and 16 depend, or claim 20. This rejection should be withdrawn for at least that reason.

Regarding claim 13, the Office asserts that "the technique of relocating a cloud, referred to by the Applicant as 'moving', is taught tangentially by Nelson et al. ('785)." Office Action at page 5. The Office further asserts, with respect to Applicant's claim 14, that Nelson teaches "dispersion of fog (i.e. a low cloud) . . . where fog evaporation equates to a cloud being raised, in the broadest reasonably interpretation, and therefor[e] moved.. Calcium chloride is named as a known exothermic hygroscopic chemical used for this purpose (Col 2, line 30-34)." *Id.* at 6.

Here, the Office entirely dismisses Nelson's further discussion, which provides that "[t]he failure of the prior art methods and agents adequately to achieve the desired fog dissipation was due to the hygroscopic nature of the materials to be used as seeding agents." Nelson at col. 1, ll. 25-29. And, as discussed above, Nelson expressly **teaches away** from use of hygroscopic seed materials, e.g., sodium chloride and calcium chloride. See *id.* at col. 2, ll. 30-35. Thus, Nelson teaches against using hygroscopic chemicals in fog dissipation. The Office again fails to consider Nelson's disclosure as a whole by simply ignoring or dismissing the contradictory teachings of Nelson.

The Office reiterates the previous rejection of Applicant's claim 1 to reject claim 16. Office Action at page 6. For at least the reasons provided above with respect



to claim 1, Applicant respectfully submits that the Office's rejection of claim 16 is likewise mistaken.

With respect to claim 20, the Office asserts that "it can be argued that the application of any of the known agent in any form of physical state, liquid (as in Montmory), solids (as in Nelson et al), or gaseous (as in Mather), can be considered to be one known by one of ordinary skill. Therefore it would have been obvious . . . to have combined the various cloud seeding and rainmaking techniques, in any combination, in order to promote rainfall onto any desired land mass, including that of between hills and mountains." Office Action at pages 6-7.

Applicant respectfully submits that the Office fails to provide any support whatsoever for that argument. As discussed above, the cited references provide numerous contradictory teachings that severely impede, if not totally preclude, the combinations that the Office insists are obvious. *See id.* The Office merely provides conclusory statements that fail to take into consideration the entire disclosure of each reference, and the claimed invention as a whole.

Applicant notes that the Office cites Fukata-2, but does not discuss any of the teachings in that document. *See* Office Action at page 5. Nonetheless, Fukata-2 provides no additional information that can cure the deficiencies discussed above. Rather, Fukata-2 actually **teaches away** from the present claims. For example, Fukata teaches that dry ice seeding "is not very scientific and efficient." Fukata-2 at col. 1, line 33. "[I]t is clear that the current dry ice based fog seeding effect is not at its best." *Id.* at col. 2, ll. 29-31. And "since the fog temperature is often above -4°C., ice nucleants like AgI do not work at all." *Id.* at col. 5, ll. 14-15. Absent the Office's

explanation, Applicant fails to see any disclosure in that document that would render the present claims obvious.

Moreover, Applicant respectfully submits that the prior art relied upon by the Examiner fails to teach a "method for activating rainfall from stratiform clouds comprising alternately dropping from aircraft at least one exothermic-hygroscopic chemical and at least one endothermic-hygroscopic chemical to cover said clouds and dispersing from aircraft at least one hygroscopic chemical on top of developing clouds" as recited in amended claim 20. The prior art fails to disclose such a method that results in the activation of "rainfall from stratiform clouds covering an area between hills and mountains." See claim 20, as amended. The prior art therefore fails to disclose each and every element recited in independent claim 20.

For at least the foregoing reasons, Applicant submits that the Office fails to establish a prima facie case of obviousness over claims 13, 14, 16, and 20, and respectfully requests that the Office withdraw the rejection.

#### **IV. Conclusion**

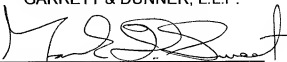
Applicant respectfully submits that the rejections under § 103(a) are overcome by the foregoing amendments and remarks. Accordingly, Applicant respectfully requests that the Office withdraw the rejections and grant the timely allowance of the pending claims.

Please grant any additional extensions of time required to enter this response  
and charge any additional required fees to Deposit Account No. 06-0916.

Respectfully submitted,

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Dated: August 6, 2009

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